

Memo regarding the application of marine water quality standards to Puget Sound.

1. Short Description of Purpose

- 1.1. The purpose for this memo is to explicitly describe the regulatory constraints on this project, methods for comparing model outputs to the water quality standards, and how we will determine what recovery looks like in terms of Puget Sound water quality improvement.
- 1.2. Secondary purpose is to provide answers to commonly asked questions about the dissolved oxygen criteria and anthropogenic allowance
- 1.3. This memo will be included in the Marine WQ/Nutrients IS starter package and used to inform the modeling and analyses to evaluate the response of nutrient reduction scenarios

2. Current Regulatory framework for the water quality standards

- 2.1. Short description of any differences between national and state standards and why we have our state standards. Perhaps allude to the push for addressing nutrients at the national level.

3. Aquatic Life Designated Uses

- 3.1. History of the DO criteria
- 3.2. Rationale behind current numeric criteria and anthropogenic allowance
- 3.3. Describe how this is intended to support the aquatic life designated uses
- 3.4. Pollutant parameters of concern and surrogates

4. Aesthetic Uses

- 4.1. How do our current criteria support this use with respect to algae blooms
- 4.2. Pollutant parameters of concern and surrogates

5. Constraints on defining the natural or reference condition

- 5.1. Describe our rationale for our assumptions that define the reference condition

6. Assessing model results with criteria

- 6.1. Statistical measures applied to interpreting continuous datasets
- 6.2. Vertical cell averaging
- 6.3. Horizontal cell averaging
- 6.4. Defining seasonal or critical periods
7. Defining what recovery looks like
 - 7.1. Comparison with the reference condition
 - 7.2. Accounting for spatial and temporal heterogeneity
 - 7.3. The anthropogenic allowance is the metric for measuring change, the goal/objective is protecting designated aquatic life and aesthetic uses.
8. Water Quality Trading Constraints (very high level)
 - 8.1. Identify examples of WQ trading that we might want to draw from
9. Identify Process and timelines for revising marine WQS
 - 9.1. The purpose for this section is to clarify the process and timeline for what would happen if we decide to go down this path. It is not intended to say that we are doing this but will inform the conversation that is already happening with some stakeholders.
 - 9.2. Re-defining/delineating designated uses
 - 9.3. Revising DO criteria
 - 9.4. Adding nutrient criteria
 - 9.5. Rationale for sticking with what we've got
 - 9.6. Opportunities for future revisions

Questions that we need to answer with this memo:

- Is the anthropogenic allowance for depleting DO the right number to use, or has Ecology considered reopening the water quality standards for revising the DO criteria?
- How do the criteria relate to protecting the aquatic life uses?
- Averaging of water column vertical needs to be defined. What is the basis for averaging?
- Does it matter if near-bottom DO is very low if the upper water column meets criteria?
- Is the anthropogenic allowance stricter than it should be to protect the designated use?
- What value of the 0.2 mg/L DO standard are we using –one day minimum value, or daily average?

- Where did these criteria come from and why were they determined to be protective?